## REMARKS/ARGUMENTS

Claims 1-18 are pending and under active examination. Favorable reconsideration is respectfully requested.

Applicants would like to thank Examiner Ip for the helpful and courteous discussion held with their representative on September 25, 2003. During that discussion, the Examiner pointed out that the experimental results presented in the specification were obtained using the secondary cold-rolling step, which is specified as an optional part of the process recited in the claims.

The present invention relates to a process for manufacturing a steel strip with low aluminum content. See Claim 1. The present invention also relates to a steel strip produced by a specified process. See Claim 9. An important aspect of Claims 1 and 9 is that the process specifies that the annealed cold-rolled strip is subjected to a secondary cold-rolling.

The present invention also relates to a steel sheet with low aluminum content, comprising:

between 0.050 and 0.080% by weight of carbon,

between 0.25 and 0.40% by weight of manganese,

less than 0.020% by weight of aluminum, and

between 0.008 and 0.016% by weight of nitrogen, the remainder being iron and inevitable trace impurities, wherein

when in an aged condition said sheet comprises a percentage elongation A% satisfying the relationship:

$$(750 - Rm)/16.5 \leq A\% \leq (850 - Rm)/17.5$$

where Rm is the maximum rupture strength of the steel, expressed in MPa.

See Claim 10.

Applicants submit herewith two graphs which provide supplementary experimental results. These graphs represent the same curves as Figures 3 and 4 of the present application, but with a supplementary curve for a cooling rate of 10°C/s.

The rejection of Claims 9-18 under 35 U.S.C. §103(a) over JP 07034192 (JP '192) or JP 10030152 (JP '152) is respectfully traversed. The cited references fail to suggest the claimed steel strip.

In accordance with the Examiner's helpful suggestion, Claim 9 has been amended to specify the secondary cold-rolling. Accordingly, Applicants submit that the steel strip recited in that claim is not suggested by JP '152 or JP '192.

With regard to Claims 10-17, JP '152 and JP '192 fail to show the particular limitation in Claim 10 "when in an aged condition said sheet comprises a percentage elongation A% satisfying the relationship: $(750-Rm)/16.5 \leq A\% \leq (850-Rm)/17.5$ where Rm is the maximum rupture strength of the steel, expressed in MPa". Nor do those references disclose the combination show the limitation of Claim 11 that the steel sheet contain COTTRELL atmospheres and/or epsilon carbides. Those references also fail to show the limitation of Claim 13 that the steel sheet contains a grain count per $mm^2$ greater than 30,000. Claims 14-16 distinguish over the cited references, because they further restrict the constituents of the steel sheet and contain the limitations otherwise of Claim 10. Finally, the references do not show the limitation of Claim 17 that the steel sheet contains a grain count per $mm^2$ greater than 40,000. Therefore, Claims 10-17 also distinguish over JP '152 and JP '192.

Further, the figures in the specification and the discussion thereof show the criticality of steps in the continuous annealing process in order to produce steel having superior characteristics and to meet the equation set forth in Claim 10 and above. For instance, Figures 3 and 4 and the discussion on page 9, line 27 through page 10, line 7 show that the

rupture strength Rm of the steel produced when the cooling rate in the annealing process is equal to 100°C/s is 560 MPa, while the rupture strength Rm reaches only 505 MPa if the cooling rate is equal to 50°C/s, outside the range of the process of the present claims. When the rupture strength Rm of 560 MPa is used in the equation of Claim 10, the inequalities of the equation are satisfied, while when a rupture strength Rm of 505 MPa is used in the equation of Claim 10, the inequalities of the equation are not satisfied.

Figure 5 shows that for the same percentage elongation in the second cold-rolling, the hardness of the steel increases if the cooling rate is equal to 100°C/s over the hardness if the cooling rate is equal to 50°C/s, outside the range of the process of the present claims.

Figure 6 and the discussion thereof on page 10 of the specification shows the importance of the thermal treatment after the rapid cooling step, because when the thermal treatment is carried out at 350°C, the Rm value is equal to 540 MPa, as compared to steels which are treated at temperatures within the range of the process of the present claims, which product Rm values of 560 MPa or more. Further, when 540 MPa is inserted into the equation of Claim 10, the inequalities are not satisfied, while, when Rm of 560 MPa is inserted into the equation of Claim 10, the inequalities are satisfied.

Figure 7 and the discussion on page 10, lines 29-31 further indicates that the thermal treatment of the steel within the range of the present claims makes it possible to increase the percentage elongation A% from 4.8% on the average to 9%, all other things being equal.

Finally, page 11 of the specification and Figure 8 show the importance of the plastic deformation limitation of Claim 18. As discussed on page 11, lines 14-23, at an identical total percentage elongation, the maximum rupture strength Rm of steel A increases significantly if a small plastic deformation by elongation is performed between annealing at high temperature and thermal treatment at low temperature. For instance, the Rm value without a plastic deformation is 660 MPa. However, if an intermediate plastic deformation is

performed with a percentage elongation equal to 1%, the total percentage elongation remaining the same, the Rm value is equal to 672 MPa and reaches 700 MPa with an intermediate plastic deformation percentage equal to 3%. Therefore, it is submitted that the criticality of the process steps in the product-by-process Claims 9 and 18 and the steel produced therefrom meeting the requirements of product Claims 10-17 has been established and, therefore, the claims distinguish over the cited references.

Based on the foregoing, withdrawal of this ground of rejection is respectfully requested.

The rejection of Claims 1-18 under 35 U.S.C. §103(a) over Maruoka et al. is respectfully traversed. That reference fails to suggest the claimed process and steel strip.

As discussed above, Claims 1 and 9 have been amended to specify the secondary cold-rolling step. In addition, Claims 10-18 are distinguished from Maruoka et al. for the same reasons as JP '152 and JP '192, discussed above. Accordingly, withdrawl of this ground of rejection is respectfully requested.

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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